

Appl. No.: 10/772,019  
Amdt. Dated: 08/22/05  
Off. Act. Dated: 03/22/05

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended): An apparatus for tracing electrical shorts in a wiring circuit under test, comprising:

means for producing a ~~sufficiently~~ continuous source of a substantially fixed current flow into a wiring circuit under test, said means for producing current configured for establishing an electrical connection to the wiring circuit anywhere along the length of the wiring circuit;

means for continuously monitoring voltage across said circuit under test; and

means for audibly indicating a sudden change in circuit conductance, in relation to a preceding value of conductance and not a fixed value of conductance.

2. (original): An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current comprises a reference circuit coupled to a control circuit having a feedback loop for maintaining a selected output current over a range of conductance for said circuit under test.

3. (original): An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current is configured for generating a fixed output current exceeding approximately one ampere.

4. (original): An apparatus as recited in claim 1, wherein said means for producing a continuous source of fixed current is configured for generating a fixed output current within the range of from approximately one-half ampere up to approximately ten amperes.

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5. (currently amended): An apparatus as recited in claim 1, wherein said means for continuously monitoring the voltage across said circuit under test comprises a voltage detector circuit configured for generating an output signal in response to detecting a sufficient voltage change across said circuit under test in a sufficiently short period of time to trigger the detector.

6. (currently amended): An apparatus as recited in claim 5, wherein said voltage detector is configured for generating said output signal in response to conductance changes in said circuit under test which create a sufficient voltage change in the circuit under test voltage in a sufficiently short period of time to trigger the detector.

7. (currently amended): An apparatus as recited in claim 6, wherein said sufficient voltage change in the circuit under test voltage sufficient to trigger the detector ~~is comprises a predetermined voltage change~~ within the range ~~[[of]]~~ from approximately 0.2 volts up to 1.0 volts.

8. (currently amended): An apparatus as recited in claim 7, wherein said sufficient voltage change in the circuit under test voltage sufficient to trigger the detector ~~is comprises a predetermined voltage change~~ within the range ~~[[of]]~~ from approximately 0.4 volts up to 0.7 volts.

9. (currently amended): An apparatus as recited in claim 1:[[.]]  
wherein said means for audibly indicating a sudden ~~rise~~ change in circuit voltage comprises an audio annunciator coupled to said voltage monitoring means and configured for producing an audible output in response to said sudden change which comprises a sudden voltage rise in circuit under test voltage; and

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wherein the sudden voltage rise of the wiring circuit is sensed in response to detection of a voltage rise which exceeds its former voltage value by at least a predetermined amount at a sufficient rate of voltage increase to trigger the detection.

10. (currently amended): An apparatus as recited in claim 1, further comprising a current selection circuit configured to allow user selection of the an amount of current being output by said continuous source of output current.

Claims 11-31 (canceled)

32. (new): An apparatus as recited in claim 10, wherein said current selection circuit is configured to allow selection of an output current at or less than a maximum allowable current for said circuit under test.

33. (new): An apparatus as recited in claim 10, wherein said current selection circuit is configured for selecting one of multiple output currents.

34. (new): An apparatus as recited in claim 1, wherein said means for continuously monitoring a voltage comprises:

a comparator circuit adapted to detect a plurality of sudden changes in applied voltage in response to said substantially fixed current flow;

a charge storage capacitor coupled to a first input of said comparator circuit configuring said comparator circuit to detect a first direction of voltage change in the wiring circuit in relation to a former voltage level; and

wherein said sudden changes in voltage are detected in response to voltage changes in the wiring circuit which exceed a predetermined voltage change within a given length of time and are communicated to said means for audibly indicating a sudden change.

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35. (new): An apparatus as recited in claim 34, further comprising means for discharging said charge storage capacitor in response to a second direction of voltage change in said wiring circuit.

36. (new): An apparatus as recited in claim 1, wherein said means for audibly indicating comprises an audio annunciator circuit configured to generate a fixed duration audio output in response to detecting said conductance change.

37. (new): An apparatus as recited in claim 36, wherein said audio annunciator circuit is configured to extend the fixed duration audio output in response to detecting repeated changes in conductance.

38. (new): An apparatus as recited in claim 1, wherein said means for audibly indicating is configured to generate an audible annunciation in response to sudden conductance changes in the circuit under test which occur singly or repeatedly.

39. (new): An apparatus as recited in claim 1, wherein said means for audibly indicating comprises an audible buzzer device.

40. (new): An apparatus for tracing electrical shorts in a wiring circuit under test, comprising:

a current source configured for connection anywhere along the length of a wiring circuit being tested and for maintaining a constant current output into the wiring circuit;

a detector circuit configured for generating an output signal in response to detecting a resistance change in the wiring circuit by at least a predetermined amount at a sufficient rate of resistance change to trigger said detector circuit; and

an annunciator circuit configured for generating an audible output in response to said output signal.

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41. (new): An apparatus for tracing electrical shorts in a wiring circuit under test, comprising:

a power supply configured to supply operating and drive current;

a voltage reference circuit;

a selector coupled to said voltage reference circuit and configured for user selection of an output current, in the range of from approximately one-half ampere to ten amperes, which is suitable for testing the wiring circuit under test;

a current driver coupled to said voltage reference circuit and said selector and configured for outputting a constant current as determined by the setting of said selector;

at least two output connections for said current driver configured for conductive coupling to the wiring circuit anywhere along its length;

a sensing circuit coupled to said current driver and configured for generating an output signal in response to detecting a sudden change in voltage in the circuit under test which exceeds a predetermined value;

wherein the sudden change in voltage of the wiring circuit is sensed in response to a rise in voltage to exceed its former voltage by at least a predetermined amount at a sufficient rate of voltage increase to trigger said sensing circuit; and

an annunciator coupled to said sensing circuit for generating an audio alert in response to said output signal.